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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,096	06/08/2006	Kyung-Ku Choi	81864.0069	1153

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EXAMINER	
HARRIS, GARY D	

ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
12/11/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/541,096	CHOI ET AL.	
	Examiner	Art Unit	
	GARY D. HARRIS	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,17 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,17 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Examiner withdraws 35 USC 112 rejections regarding high frequency.

Applicant's arguments, see remarks, filed 07/06/2009, with respect to the rejection(s) of claim(s) 1-4, 6-7, 17 and 19-20 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Takeshi et al. JP 02-201904 and further in view of Fugimori JP 10-189322 A.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12, 17, 19, 20 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. JP 02-201904 in view of Fugimori JP 10-189322 A.

As to Claim 1, Takeshi et al. JP 02-201904 discloses a granular substance (ferromagnetic particles) and a nonmagnetic insulating organic material (polymer). The ferromagnetic metal particles are dispersed in said nonmagnetic insulating organic

material where a deposition of the polymer occurs between the ferromagnetic particles. JP '904 does not disclose the particle size however, the resistivity shown is 180 micro-ohm-cm or more (similar to applicant) (abstract).

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size of 10 nm or less (Paragraph 0012) in creating a film with high specific resistance and simultaneously reducing the eddy current loss. It would have been obvious to select ferromagnetic particles from 5 to 15 nm in creating a film with high specific resistance while simultaneously reducing the eddy current loss.

Additionally, JP '322 discloses a surface ratio of not larger than 15 percent (table 1, line 11 and 14).

The surface area ratio is: $(4*pi*r^2)_a/(4*pi*r^2)_b$ is <15% which would be reduced to r^2_a/r^2_b< 15% (JP '322)

Applicant claim is for volume ratio which would be reduced to r^3_a/r^3_b< 5 to 50% (applicant)

Given that both JP' 322 and applicant considered ratios. One looking at the above relationships would realize that they both obtain a ratio of the radius of a ferromagnetic particle and oxide layer.

JP '322 is using a Fe and Co soft magnetic material (Paragraph 0005, 0006 & 007) surrounded by an insulating matrix (Fe-M-O, Co-M-O) where M is an element easily combined with oxygen (Paragraph 0007). Where the "M" is disclosed as being Si or Al in the case of Co-M-O. The ratio is considered a result effective variable as the

volume ratio (and/or the area ratio) would be changed by the diffusion of oxygen (Paragraph 0031) in determining the desired resistivity. That is, as the oxygen increases the resistivity will increase.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the volume ratio to change the resistivity of the film. In the present invention one would have been motivated to optimize the volume ratio of the insulating organic material in the granular material in the range of 5 to 50% in order to change the films resistivity. It has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 220 F.2d 454, 105 USPQ 233 (CCPA 1955).

As to Claim 2 & 3 Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) (abstract).

JP '932 discloses a NiFe alloy (Paragraph 0002) and ferromagnetic elements including Fe and Co combined with oxygen to create a granular substance (Paragraph 0007) in obtaining high specific resistance. It would have been obvious to utilize ferromagnetic particles of Fe and Co in order to obtain high specific resistance.

As to Claim 4, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) but does not disclose atomic percentages (abstract).

JP '932 discloses soft magnetic particles made from Fe and cobalt (Paragraph 0017) and substituting cobalt into the Fe phase (Paragraph 0020). The Fe phaseFe3O4 which would be 72 at% (given atomic mass of Fe=55.845 and O=15.994) ZnFe2O4 and MgFe2O4 (Paragraph 0022). However, JP '932 teaches adding a nonmagnetic metal which does not oxidize as easy at a rate below 20 atomic percent (Paragraph 0015 & 0023). JP'932 discloses manipulating the atomic percentage of Fe and Co in avoiding oxidation. It would have been obvious to one skilled in the art to control the range of Fe and Co from 10 to 50 atomic percentage in order to avoid oxidation.

As to Claim 5, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and polymer between the particles (spaced apart a distance) that would be capable of exchange coupling (abstract).

As to Claim 6, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and a polymer (nonmagnetic insulating organic material) between the particles (spaced apart a distance) (abstract).

As to Claim 7, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and polymer between the particles (abstract) but does not disclose the volume ratio.

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size similar to those claimed (Paragraph 0012) in creating a film with high specific resistance and simultaneously reducing the eddy current loss. JP '322 discloses a surface ratio of not larger than 15 percent (table 1. line 11 and 14). Given that the ferromagnetic particle size is similar (5 to 15nm) the volume ratio would necessarily be similar. The ratio is considered a result effective variable as the volume ratio would be changed in determining the desired resistivity. As the volume ratio increases, the material resistivity will change. Absent unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the volume ratio since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 220 F.2d 454, 105 USPQ 233 (CCPA 1955). In the present invention one would have been motivated to optimize the volume ratio of the insulating organic material in the granular material in the range of 5 to 40% in order to change the films resistivity.

As to Claim 8, 9, 10 & 22, Takeshi et al. JP 02-201904 discloses the granular substance has a saturation magnetization of 800G or more (see abstract).

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size similar to applicant (Paragraph 0012) and a high saturation magnetization flux density beyond 1.3T (greater

than 6kG) in obtaining high specific resistance (Paragraph 0017). The complex permeability at 1 GHz, or the quality factor Q of 1 or more is not disclosed.

Both Takeshi '904 and JP '322 are using a Fe and Co soft magnetic material (Paragraph 0005, 0006 & 007) surrounded by an insulating matrix (Fe-M-O, Co-M-O). Where M is an element easily combined with oxygen (Paragraph 0007). The "M" is disclosed as being Si or Al in the case of Co-M-O. Given that the materials and size are similar they would inherently have similar complex permeability and quality factor Q as claimed. The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the subject matter is in fact inherent in the prior art reference.

As to Claim 11, Takeshi et al. JP 02-201904 discloses the granular substance has a saturation magnetization of 800G or more (see abstract).

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size similar to applicant (Paragraph 0012) and a high saturation magnetization flux density beyond 1.3T (greater than 6kG) in obtaining high specific resistance (Paragraph 0017) while having a low permeability (table 2). It would have been obvious to require the granular substance to have greater than 6 kG or more in order to obtain a high specific resistance while maintaining a low permeability (mu).

As to Claim 12, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles having 180 micro-ohm-cm or more (abstract)

As to Claim 17, Takeshi et al. JP 02-201904 discloses a granular substance (ferromagnetic particles) and a nonmagnetic insulating organic material (polymer). The ferromagnetic metal particles are dispersed in said nonmagnetic insulating organic material where a deposition of the polymer occurs between the ferromagnetic particles. JP '904 does not disclose the particle size however, the resistivity shown is 180 micro-ohm-cm or more (similar to applicant) (abstract).

JP 10-189322 discloses a soft magnetic granular substance in a nonmagnetic insulating material (Paragraph 0004) having a mean particle size of 10 nm or less (Paragraph 0012) in creating a film with high specific resistance and simultaneously reducing the eddy current loss. It would have been obvious to select ferromagnetic particles from 5 to 15nm in creating a film with high specific resistance while simultaneously reducing the eddy current loss.

Additionally, JP '322 discloses a surface ratio of not larger than 15 percent (table 1. line 11 and 14). Given that the ferromagnetic particle size is similar (5 to 15nm) the volume ratio would be similar. The ratio is considered a result effective variable as the volume ratio (and/or the area ratio) would be changed by the diffusion of oxygen (Paragraph 0031) in determining the desired resistivity. That is, as the oxygen increases the resistivity will increase. It should be noted that volume ratio is a result effective variables. As the volume ratio increases, the material resistivity will change. Absent unexpected results, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to optimize the volume ratio since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 220 F.2d 454, 105 USPQ 233 (CCPA 1955). In the present invention, one would have been motivated to optimize the volume ratio of the insulating organic material in the granular material in the range of 5 to 50% in order to change the films resistivity.

As to Claim 19, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) (abstract). JP '932 discloses a NiFe alloy (Paragraph 0002) and ferromagnetic elements including Fe and Co combined with oxygen to create a granular substance (Paragraph 0007) in obtaining high specific resistance.

As to Claim 20, Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles (Fe, Co, Ni) and a polymer (nonmagnetic insulating organic material) between the particles (spaced apart a distance) (abstract).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. JP 02-201904 in view of Fugimori JP 10-189322 A and further in view of . Gay et al. US 5,629,092.

As to Claim 21 Takeshi et al. JP 02-201904 discloses the granular substance is ferromagnetic and soft magnetic particles having 180 micro-ohm-cm or more (abstract) but does not disclose the polymer. However, Gay et al. US 5,629,092 discloses soft

ferromagnetic particles coated with Teflon (applicants fluoropolymer) in obtaining high lubricity (Col. 5, Line 62-67, 1-45 respectively). It would have been obvious to select a fluoropolymer for the polymer in Takeshi et al. '904 in order to obtain high lubricity.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GARY D. HARRIS whose telephone number is (571)272-6508. The examiner can normally be reached on 8AM - 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/
Supervisory Patent Examiner, Art Unit 1794

/G. D. H./Gary Harris
Examiner, Art Unit 1794